## Lesson 10: Rate of Change

* Let’s calculate the rate of change of some relationships.

### 10.1: Growing Bamboo

The graph represents function $h$, which gives the height in inches of a bamboo plant $t$ months after it has been planted.



1. What does this statement mean? $h\left(4\right)=24$
2. What is the value of $h\left(10\right)$?
3. What is $c$ if $h\left(c\right)=30$?
4. What is the value of $h\left(12\right)−h\left(2\right)$?
5. How many inches does the plant grow each month? How can you see this on the graph?

### 10.2: A Growing Account Balance

The balance in a savings account is defined by the function $b$. This graph represents the function.



1. What is . . .
	1. $b\left(3\right)$
	2. $b\left(7\right)$
	3. $b\left(7\right)−b\left(3\right)$
	4. $7−3$
	5. $\frac{b\left(7\right)−b\left(3\right)}{7−3}$
2. Also calculate $\frac{b\left(11\right)−b\left(1\right)}{11−1}$
3. You should have gotten the same value, twice. What does this value have to do with this situation?

### 10.3: The Temperature Outside

Here are a graph and a table that represent the same function. The function relates the hour of day to the outside air temperature in degrees Fahrenheit at a specific location.

| $t$ | $p\left(t\right)$ | $t$ | $p\left(t\right)$ |
| --- | --- | --- | --- |
| 0 | 48 | 6 | 57 |
| 1 | 50 | 7 | 56 |
| 2 | 55 | 8 | 55 |
| 3 | 53 | 9 | 50 |
| 4 | 51.5 | 10 | 52 |
| 5 | 52.5 |  |  |



Match each expression to a value. Then, explain what the expression means in this situation.

1. $p\left(12\right)$
2. $p\left(8\right)$
3. $p\left(12\right)−p\left(8\right)$
4. $12−8$
5. $\frac{p\left(12\right)−p\left(8\right)}{12−8}$
6. $p\left(10\right)$
7. $p\left(20\right)$
8. $p\left(10\right)−p\left(20\right)$
9. $10−20$
10. $\frac{p\left(10\right)−p\left(20\right)}{10−20}$
* 4
* -2.75
* 44
* -1.4
* 55
* 14
* -11
* 38
* -10
* 52



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